

CLAIMS

We claim:

1. A protective formulation for birds of the order Galliformes comprising a protective amount of a *Mycoplasma gallisepticum* bacterial strain

5 having a RAPD pattern substantially corresponding to at least one of the band patterns of K5054, deposited at the ATCC, Patent Deposit Designation PTA-4507, as shown in Figures 1, 2, and 3,

 wherein the band pattern of K5054 in Figure 1 is generated using as a primer SEQ. ID NO: 4,

10 wherein the band pattern of K5054 is generated using as primers SEQ. ID NO. 5, SEQ. ID NO: 6, and SEQ. ID NO. 7,

 wherein the band pattern of K5054 is generated using as a primer SEQ. ID NO: 8,

 and a pharmaceutically acceptable carrier.

15 2. The formulation of claim 1, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of a bird.

3. The formulation of claim 1, wherein the protective amount is between about 50 and about 50,000 ccu/bird.

4. The formulation of claim 1, wherein the protective amount is about 5,000 ccu/bird.

20 5. The protective formulation of claim 1, wherein the *Mycoplasma gallisepticum* bacterial strain has RAPD patterns substantially corresponding to at least two of the band patterns of K5054 as shown in Figures 1, 2, and 3.

6. The formulation of claim 5, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of a bird.

7. The formulation of claim 5, wherein the protective amount is between about 50 and about 50,000 ccu/bird.
8. The formulation of claim 5, wherein the protective amount is about 5,000 ccu/bird.
9. The protective formulation of claim 1, wherein the *Mycoplasma gallisepticum* bacterial
5 strain has RAPD patterns substantially corresponding to all three band patterns of K5054 as shown in Figures 1, 2, and 3.
10. The formulation of claim 9, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of a bird.
11. The formulation of claim 9, wherein the protective amount is between about 50 and
10 about 50,000 ccu/bird.
12. The formulation of claim 9, wherein the protective amount is about 5,000 ccu/bird.
13. A protective formulation for birds of the order Galliformes comprising a protective amount of a *Mycoplasma gallisepticum* bacterial strain that has a PvP surface adhesin gene with a nucleotide sequence with at least 98% homology to Sequence ID NO: 1 and a
15 pharmaceutically acceptable carrier.
14. The formulation of claim 13, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of a bird.
15. The formulation of claim 13, wherein the protective amount is between about 50 and about 50,000 ccu/bird.
- 20 16. The formulation of claim 13, wherein the protective amount is about 5,000 ccu/bird.
17. A protective formulation for birds of the order Galliformes comprising a protective amount of a *Mycoplasma gallisepticum* bacterial strain that has a surface lipoprotein gene with a nucleotide sequence with at least 98% homology to Sequence ID NO: 2 and a pharmaceutically acceptable carrier.

18. The formulation of claim 17, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of a bird.

19. The formulation of claim 17, wherein the protective amount is between about 50 and about 50,000 ccu/bird.

5 20. The formulation of claim 17, wherein the protective amount is about 5,000 ccu/bird.

21. A protective formulation for birds of the order Galliformes comprising a protective amount of a *Mycoplasma gallisepticum* bacterial strain with identifying characteristics similar to that of the K5054 *Mycoplasma gallisepticum* bacterium deposited at the ATCC, Patent Deposit Designation PTA-4507, and a pharmaceutically acceptable carrier.

10 22. The formulation of claim 21, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of a bird.

23. The formulation of claim 21, wherein the protective amount is between about 50 and about 50,000 ccu/bird.

24. The formulation of claim 21, wherein the protective amount is about 5,000 ccu/bird.

15 25. A vaccine for birds of the order Galliformes comprising a protective amount of a *Mycoplasma gallisepticum* bacterial strain

having a RAPD pattern substantially corresponding to at least one of the band

patterns of K5054, deposited at the ATCC, Patent Deposit Designation PTA-4507,

as shown in Figures 1, 2, and 3,

20 wherein the band pattern of K5054 in Figure 1 is generated using as a primer SEQ. ID NO: 4,

wherein the band pattern of K5054 is generated using as primers SEQ. ID NO. 5, SEQ. ID NO: 6, and SEQ. ID NO. 7,

wherein the band pattern of K5054 is generated using as a primer

25 SEQ. ID NO: 8,

and a pharmaceutically acceptable carrier.

26. The vaccine of claim 25, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of each bird.

27. The vaccine of claim 25, wherein the protective amount is between about 50 and about
5 50,000 ccu/bird.

28. The vaccine of claim 25, wherein the protective amount is about 5,000 ccu/bird.

29. The vaccine of claim 25, wherein the *Mycoplasma gallisepticum* bacterial strain has RAPD patterns substantially corresponding to at least two of the band patterns of K5054 as shown in Figures 1, 2, and 3.

10 30. The vaccine of claim 29, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of each bird.

31. The vaccine of claim 29, wherein the protective amount is between about 50 and about 50,000 ccu/bird.

32. The vaccine of claim 29, wherein the protective amount is about 5,000 ccu/bird.

15 33. The vaccine of claim 31, wherein the *Mycoplasma gallisepticum* bacterial strain has RAPD patterns substantially corresponding to all three band patterns of K5054 as shown in Figures 1, 2, and 3.

34. The vaccine of claim 25, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of each bird.

20 35. The vaccine of claim 33, wherein the protective amount is between about 50 and about 50,000 ccu/bird.

36. The vaccine of claim 33, wherein the protective amount is about 5,000 ccu/bird.

37. A vaccine for birds of the order Galliformes comprising a protective amount of a *Mycoplasma gallisepticum* bacterial strain that has a PVP surface adhesin gene with a

nucleotide sequence with at least 98% homology to Sequence ID NO: 1 and a pharmaceutically acceptable carrier.

38. The vaccine of claim 37, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of each bird.

5 39. The vaccine of claim 37, wherein the protective amount is between about 50 and about 50,000 ccu/bird.

40. The vaccine of claim 37, wherein the protective amount is about 5,000 ccu/bird.

41. A vaccine for birds of the order Galliformes comprising a protective amount of a *Mycoplasma gallisepticum* bacterial strain that has a surface lipoprotein gene with a
10 nucleotide sequence with at least 98% homology to Sequence ID NO: 1 and a pharmaceutically acceptable carrier.

42. The vaccine of claim 41, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of each bird.

43. The vaccine of claim 41, wherein the protective amount is between about 50 and about
15 50,000 ccu/bird.

44. The vaccine of claim 51, wherein the protective amount is about 5,000 ccu/bird.

45. A vaccine for birds of the order Galliformes comprising a protective amount of a *Mycoplasma gallisepticum* bacterial strain with identifying properties similar to that of the K5054 *Mycoplasma gallisepticum* bacterium deposited at the ATCC, Patent Deposit
20 Designation PTA-4507, and a pharmaceutically acceptable carrier.

46. The vaccine of claim 45, wherein the protective amount is that amount required for the *Mycoplasma gallisepticum* strain to colonize the upper respiratory tract of each bird.

47. The vaccine of claim 45, wherein the protective amount is between about 50 and about 50,000 ccu/bird.

25 48. The vaccine of claim 45, wherein the protective amount is about 5,000 ccu/bird.

49. An essentially biologically pure culture of a *Mycoplasma gallisepticum* bacterium with identifying characteristics similar to *Mycoplasma gallisepticum* strain K5054 as deposited with the ATCC, Patent Deposit Designation PTA-4507.

50. A method for protecting a bird of the order Galliformes comprising administering the
5 *Mycoplasma gallisepticum* formulation as recited in claim 1 to a bird after the bird hatches.

51. The method claim 50, wherein the formulation is administered during the first 18 weeks after the bird hatches.

52. The method in claim 50, wherein the formulation is administered about at least 2 weeks after the bird hatches.

10 53. The method of claim 50, wherein the bird is a chicken.

54. The method of claim 50, wherein the bird is a turkey.

55. The method in claim 50, wherein the formulation is administered to the respiratory mucosa.

56. The method claim 50, wherein the formulation is administered by eyedrops.

15 57. The method claim 50, wherein the formulation is administered nasally.

58. The method claim 50, wherein the formulation is administered by aerosol.

59. The method claim 50, wherein the formulation is administered by drinking water.

60. The method claim 50, wherein about 50 and about 50,000 ccu/bird of the formulation
20 are administered to each bird.

61. The method of claim 50, wherein about 5,000 ccu/bird are administered to each bird.

62. The method of claim 50, further comprising the step of administering at least one booster formulation to the bird.

63. A method for protecting a bird of the order Galliformes against *Mycoplasma*
25 *gallisepticum*, comprising

administering a non-immunopathogenic *Mycoplasma gallisepticum* strain to a bird after the bird hatches, such that the strain persists in the respiratory epithelium of the bird and excludes other *Mycoplasma gallisepticum* strains from the respiratory epithelium.

64. The method of claim 63, wherein the non-immunopathogenic *Mycoplasma*

5 *gallisepticum* strain is a strain of similar identifying characteristics as strain K5054 deposited at the ATCC, Patent Deposit Designation PTA-4507.

65. The method of claim 63, wherein the non-immunopathogenic *Mycoplasma gallisepticum* strain is strain K5054 deposited at the ATCC, Patent Deposit Designation PTA-4507.